MOTHER TERESA
INSTITUTE OF SCIENCE AND TECHNOLOGY
Approved by AICTE, Govt. of Telangana , Affiliated to JNTUH & SBTET, Hyderabad
Recognition under Section 2(f) & 12 (B) of the UGC Act, 1956
SANKETIKA NAGAR, KOTHURU (V), SATHUPALLY – 507303, KHAMMAM Dist., TELANGANA
Phone : 9494641251, Email ID : info@mistech.ac.in

ACCREDITED BY NAAC

B - GRADE

DEPARTMENT OF CIVIL ENGINEERING
ACADEMIC YEAR: 2018-19
A SUMMARY REPORT

Course Name: Besic Mechanical Engineering for Civil Engineers.

Name of the Resource Person: Mr. M.Chennakeshava Rao, NRI Institute of Technology,
Pothavarappadu (V), Via Nunna, Agiripalli (M),
Vijayawada Rural, Krishna District, Andhra Pradesh.

Gap Identified: Analysis of Different materials strength.

No. of Students attended: 37 members

Summary: On the day of the session (i.e 03-12-2018) Mr. M.Chennakeshava Rao delivered a lecture on the basics of Introduction to the course of Definition. In the mechanics of materials, the strength of a material is its ability to withstand an applied load without failure or plastic deformation. The field of strength of materials deals with forces and deformations that result from their acting on a material. The field of strength of materials, also called mechanics of materials, typically refers to various methods of calculating the stresses and strains in structural members, such as beams, columns, and shafts.

The methods employed to predict the response of a structure under loading and its susceptibility to various failure modes takes into account the properties of the materials such as its yield strength, ultimate strength, Young's modulus, and Poisson's ratio. In addition, the mechanical element's macroscopic properties (geometric properties) such as its length, width, thickness, boundary constraints and abrupt changes in geometry such as holes are considered. In the mechanics of materials, the strength of a material is its ability to withstand an applied load without failure or plastic deformation.

The field of strength of materials deals with forces and deformations that result from their acting on a material. A load applied to a mechanical member will induce internal forces within the member called stresses when those forces are expressed on a unit basis. The stresses acting on the material cause deformation of the material in various manners including breaking them completely. Deformation of the material is called strain when those deformations too are placed on a unit basis.

The stresses and strains that develop within a mechanical member must be calculated in order to assess the load capacity of that member. This requires a complete description of the geometry of the member, its constraints, the loads applied to the member and the properties of the material of which the member is composed. The applied loads may be axial (tensile or compressive), or rotational (strength shear). With a complete description of the loading and the geometry of the member, the state of stress and state of strain at any point within the member can be calculated. Once the state of stress and strain within the member is known, the strength (load carrying capacity) of that member, its deformations (stiffness qualities), and its stability (ability to maintain its original configuration) can be calculated.

The calculated stresses may then be compared to some measure of the strength of the member such as its material yield or ultimate strength. The calculated deflection of the member may be compared to deflection criteria that are based on the member's use. The calculated buckling load of the member may be compared to the applied load. The calculated stiffness and mass distribution of the member may be used to calculate the member's dynamic response and then compared to the acoustic environment in which it will be used.

Material strength refers to the point on the engineering stress–strain curve (yield stress) beyond which the material experiences deformations that will not be completely reversed upon removal of the loading and as a result, the member will have a permanent deflection. The ultimate strength of the material refers to the maximum value of stress reached. The fracture strength is the stress value at fracture Strength of materials, also know as mechanics of materials, is focused on analyzing stresses and deflections in materials under load. Knowledge of stresses and deflections allows for the safe design of structures that are capable of supporting their intended loads.

The mechanical properties of a material affect how it behaves as it is loaded. The elastic modulus of the material affects how much it deflects under a load, and the strength of the material determines the stresses that it can withstand before it fails. The ductility of a material also plays a significant role in determining when a material will break as it is loaded beyond its elastic limit. Because every mechanical system is subjected to loads during operation, it is important to understand how the materials that make up those mechanical systems behave.

This page describes the mechanical properties of materials that are relevant to the design and analysis of mechanical systems.

- Stress and Strain
- Stress-Strain Curve
- True Stress and Strain
- Hooke's Law
- Hooke's Law in Shear
- Poisson's Ratio
- Strain Hardening
- Elastic and Plastic Strain

- Ductility
- Ductile and Brittle Materials
- Strain Energy
- Strain Energy Density
- Modulus of Resilience
- Modulus of Toughness
- Stress-Strain Curve Approximation

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Dt: 03-12-2018.

To
Mr. M.Chennakeshava Rao,
NRI Institute of Technology,
Pothavarappadu (V), Via Nunna,
Agiripalli (M), Vijayawada Rural,
Krishna District,
Andhra Pradesh.

Sub: Letter of Appreciation– Reg.

Dear Sir,

    We would like to thank you for being delivered the keynote lecture on "Analysis of Different materials strength" on 03rd DEC, 2018 for a Programme on **"BESIC MECHANICALENGINEERING FOR CIVIL ENGINEERS"** organized by Department of Civil Engineering Conducted at Mother Teresa Institute of Science and Technology. Your views on new research areas in Civil Engineering and assessing the outgrowing needs in a competitive challenging environment helps the students to explore the industrial challenges.

Thanking you

With Regards

(Dr. C. Hari Krishna)
Principal